China

Name: China Civil Engineering Society (CCES)
Type of Structure: Non profit, open association
Number of Members: Total number 44,923 people, 1,236 corporate members.

ASSOCIATION ACTIVITIES DURING 2020 AND TO DATE

1. Academic Activities

Hosting the "High-End Forum on Construction Technology of Super Large Section Shield Tunnels Across River and Sea" - On August 22, 2020, the High-End Forum on Construction Technology of Super Large Section Shield Tunnels Across River and Sea was held in Shantou City, Guangdong Province on the occasion of completing the tunnelling work of the Shantou Gulf Tunnel Project. Online virtual parallel sessions were also held during the forum, with more than 700 experts participating in the forum in total, 300 people were in the main venue and more than 400 people in 13 other online parallel sessions.

Hosting the "China Tunnel and Underground Engineering Conference (CTUC) in 2020 and the 21st Annual Conference of Tunnel and Underground Works Branch of Chinese Civil Engineering Society (CCES-TUWB)" - The CTUC 2020 & 21st CCES-TUWB Annual Conference was successfully held on November 27 to 29 in Shenzhen co-

organized by CCES-TUWB and Shenzhen University. The theme of the conference is "Challenges and Opportunities of Modern Tunnels and Underground Engineering - Green, Smart, Safe and Efficient". More than 200 experts and scholars delivered brilliant academic presentations. At the same time, the innovative mode of "online + offline conferences" was adopted to realize the simultaneous online webcast of the main forum and sub-forums, with more than 1,600 participants attending the conference, 6.1 million people participating in the online main forum and 2 million people participating in the online sub-forums.

2. Publication

Since the first issue in 1964, Modern Tunnelling Technology is committed to academic exchange and technical progress in tunnelling. As the leading technical journal in the Chinese tunnelling industry and the official journal of the Tunnel and Underground Works Branch of the Chinese Civil Engineering Society, it is published bi-monthly with a focus on review & discussion, theoretical research, analysis & numerical simulation, planning & design, construction technology, construction equipment and materials, and so on. The proceedings of the "2020 China Tunnel and Underground Engineering Conference (CTUC) and the 21st Annual Conference of Tunnel and Underground Works Branch of Chinese Civil Engineering Society" was published as a supplement of the periodical Modern Tunnelling Technology.

CURRENT TUNNELLING ACTIVITIES

Gaoligongshan Railway Tunnel (see fig. 1)

The Gaoligongshan Railway Tunnel, 34,538m long, adopts an auxiliary gallery arranged in "through parallel adit + 1 inclined shaft + 2 vertical shafts". The main shaft of the Inclined Shaft 1# is 3,850m long, and the auxiliary shaft is 3870m; the main shaft of Vertical Shaft 1# is 762.59m deep, and the auxiliary shaft, 764.74m; the main shaft of Vertical shaft 2# is 640.22m deep, and the auxiliary shaft, 640.36m. Two TBMs are applied for excavation (the large TBM of 9.03m in diameter for the main tunnel, and the small TBM of 6.39m in diameter for the parallel adit). The geological structure of the tunnelling area is extremely complex, with characteristics of "three Highs (High geotherm, high in-situ stress, high seismic intensity)" and "four Actives (active neotectonics movement, active geo-hydrothermal environment, active

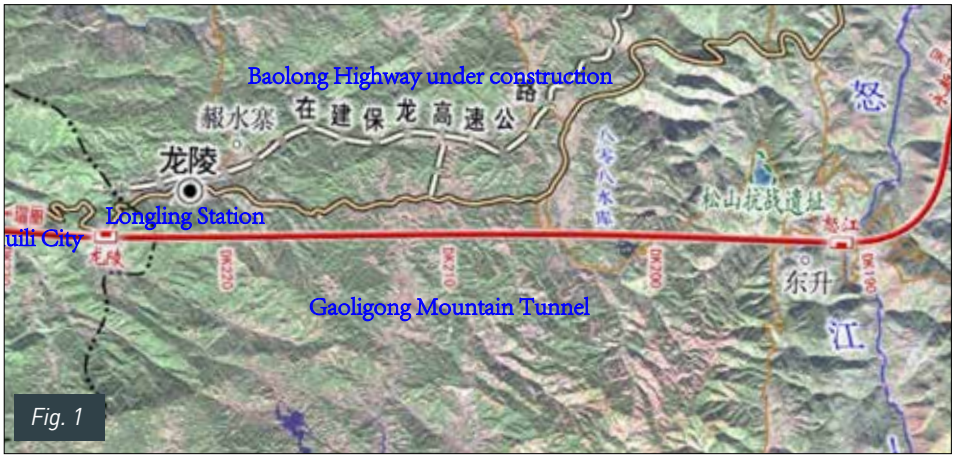

Fig. 1

exogenetic force, and active epigenetic and superficial transformation of slope)". Unfavourable geological phenomena such as strong seismic activity, large (giant) landslides are concentrated in the area. The high geothermal temperature is a big challenge - the cross-ridge section is located at a high geothermal zone of Tibet and Yunnan Province, the water temperature up to 102- . It is extremely difficult to build the shafts as they are located in the migmatitic granite, with irregular groundwater distribution, the connected vertical fissures and the large amount of groundwater.

13,122m of the tunnel has been excavated to now, accounting for 38%. The main tunnel is expected to be fully completed on January 8, 2024.

Su'ai Immersed Tunnel Project (see fig. 2)

Su'ai Immersed Tunnel Project is a complex line on the longitudinal national highway G324 in Shantou City's arterial highway network planning. The project is located between Shantou Bay Bridge and Shantou Queshi Bridge, starting from the intersection of Tianshan South Road and Jinsha East Road in Longhu District, ending at the foot of Hutou Mountain in Nanbin area of CITIC Coastal New Town, connecting to the planned Anhai Road, with a total length of 6.68km. The connection section on the north shore is 0.5km long, the connection section on the south shore is 1.35km long, and the single tunnel is 4.95km long. The tunnel is designed for two-way six-lane traffic, its seismic fortification standard is in conformity with seismic basic intensity of and first safety class (highest).

The tunnel will be completed in August 2020 and is scheduled to open to traffic in September 2021.


Fig. 2

Shenzhen-Zhongshan Channel (see fig. 3)

Shenzhen-Zhongshan Channel Project is a cross-sea cluster project that integrates bridge, island, tunnel and underwater interchange. The project is 24km in length, including a 6.8m subsea immersed tunnel, a 17.2m bridge and two artificial islands in the east and west. The project is designed and constructed in accordance with the technical standard of a two-way eight-lane highway with a design speed of 100km/h.

The East Artificial Island is located on the Shenzhen's shore, i.e., on the south to Shenzhen Bao'an Airport, close to Shenzhen Airport Ferry Terminal. The island is 930m long, with a north-south axis length of 1136m, a land elevation of 4.9m, and a land area of about 335,100 square meters, which is equivalent to 47 international standard football fields. It will be open to traffic in June 2024.

Fig. 3

FUTURE TUNNELLING ACTIVITIES

By the end of 2020, there were 3,566 planned tunnel projects under the program in China, with a combined length of 8,036km, 136 of which are extra-long tunnels, totalling 1,891km in length.

Name of tunnel	Length (m)	Design Speed (km/h)	Construction Plan
Qinling-Mabaishan Tunnel	22,922	350	Single tube, two lanes
Qinling-Taixingshan Tunnel	18,844	350	Single tube, two lanes
Lucaoliang Tunnel	18,040	350	Single tube, two lanes
Fuxian Tunnel	16,292.65	350	Single tube, two lanes
Taibantian Tunnel	16,090	350	Single tube, two lanes
Meizishan Tunnel	11,720	350	Single tube, two lanes
Zhengjia Tunnel	12,965	200 *250 as reserved*	Single tube, two lanes
Lunanshan Tunnel	17,475	350	Single tube, two lanes
Pengdong Tunnel	13,000	350	Single tube, two lanes
Dabashan Tunnel	14,128	350	Single tube, two lanes
Shijialiang Tunnel	12,090	350	Single tube, two lanes
Guanmianshan Tunnel	18,181	350	Single tube, two lanes
Jinzhuba Tunnel	10,320	350	Single tube, two lanes
Yongsheng Tunnel	18,085	350	Single tube, two lanes
Yunwushan Tunnel	10,925	350	Single tube, two lanes
Gongling Tunnel	10,974	350	Single tube, two lanes
Xindi Tunnel	14,250	250	Single tube, two lanes
Baotian Tunnel	11,203.728	250	Single tube, two lanes
Xinmeilin Tunnel	11,205	350	Single tube, two lanes
Yiliang Tunnel	24,792	350	Single tube, two lanes
Changling Gang Tunnel	12,740	350	Single tube, two lanes
Jiuliwan Tunnel	19,540	350	Single tube, two lanes
Baimashan Tunnel	13,407	350	Single tube, two lanes

Name of tunnel	Length (m)	Design Speed (km/h)	Construction Plan
Daling Tunnel	12,960	350	Single tube, two lanes
Gandeershan Tunnel	12,095	250	Single tube, two lanes
Changqing Tunnel	11,310.69	350	Single tube, two lanes
Wutaishan Tunnel	14,755	350	Single tube, two lanes
Congtai-Yangtze Tunnel	14,220	350	Single tube, two lanes
Zhongtianshan Tunnel	13,371	250	Single tube, two lanes
Gushan Tunnel	11,430	350	Single tube, two lanes
Nanaoshan Tunnel	22,110	350	Double tube, single lane
Yangshan Tunnel	14,835	350	Single tube, two lanes
Daxing'anling Tunnel	17,750	250	Single tube, two lanes
Gonggua Tunnel	11,255	350	Single tube, two lanes
Tianjieshan Tunnel	14,612	350	Single tube, two lanes
Aoling Tunnel	16,130	350	Single tube, two lanes
Mayandun Tunnel	11,086	350	Single tube, two lanes
Jintang Subsea Tunnel	16,200	250	Single tube, two lanes
Jinggangshan Tunnel	14,407	350	Single tube, two lanes
Dabie Shan Tunnel *(within Hubei Province)*	11,917	350	Single tube, two lanes
Pingshan East Tunnel	27,762	350	Single tube, two lanes
Suzhou East Tunnel	14,520	350	Single tube, two lanes
Dingnaoping Tunnel	10,251	350	Single tube, two lanes
Wufeng Tunnel	13,032	350	Single tube, two lanes
Qingtianling Tunnel	13,190	250	Single tube, two lanes
Pingtoushan Tunnel	13,000.75	250	Single tube, two lanes

There are 1811 railway tunnels under construction, with a total length of 2,750km, 50 of which are extra-long tunnels, totalling 645km in length.

EDUCATION ON TUNNELLING IN THE COUNTRY

Tongji University: Tunnel Engineering
Tsinghua University: Tunnel Engineering
Central South University: Tunnel Engineering
Southwest Jiaotong University: Tunnel Engineering, etc